



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/277,328	03/26/99	KNEISSL	D/9877913

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MM91/0926

EXAMINER

SCHILLINGER, L

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 09/26/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/277,328

Applicant(s)

KNEISSL ET AL.

Examiner

Laura M Schillinger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-13 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 5 teaches cleaving with a laser and applicant has successfully identified allowable subject matter- however in order to be allowed claim 5 must be rewritten in independent form.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371⁶ of this title before the invention thereof by the applicant for patent.

2. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Bowers et al ('687).

In reference to claim 1, Bowers teaches a method comprising the steps of:

providing a semiconductor membrane having an insulating substrate (Abs. Lines: 1-5 Fig.2 (12));

attaching a metallic interlayer to a second side of the membrane first side of the semiconductor membrane (Abs. Lines: 1-5 and Fig.2 (20));

attaching a thermally conducting substrate to a second side of the membrane (Col.4, lines: 5-25 and Fig.2 (10));

removing the insulating substrate from the first side of the semiconductor membrane (Col.4, lines: 10-15); and

placing a metal layer on the first side of the membrane (Col.7, lines: 40-50).

Response to Arguments

Applicant's arguments filed 8/17/01 have been fully considered but they are not persuasive. Applicant argues that Bowers fails to teach a solder interlayer, however this is incorrect. Applicant's own specification discloses that the solder material may be comprised of In- this interlayer is clearly taught by Bowers- thus anticipating the limitations of claims 1 and 4. Applicant's arguments further incorrectly assert that this solder interlayer limitation was added to independent claim 9- this is also incorrect- applicant failed to add this limitation into claim 9.

Applicant further asserts that Bowers fails to teach cleaving the substrates apart through the use of a laser, as claimed in claims 5 and 8- this is partially persuasive and partially incorrect. Claim 5 teaches cleaving with a laser and applicant has successfully identified allowable subject matter- however in order to be allowed claim 5 must be rewritten in independent form. Furthermore, claim 8 fails to depend on claim 5 nor contain such allowable subject matter. Therefore such an assertion is wrong.

In reference to claim 2, Bowers teaches wherein the substrate is sapphire (Abs., lines: 1-5).

In reference to claim 3, Bowers teaches wherein the metallic interlayer is a solder layer (Fig.2 (10)- note that Applicant's specification teaches that In is a solder).

In reference to claim 4, Bowers teaches wherein the solder is selected from the group of In, PbSn and AuSn (Fig.2 (20)).

In reference to claim 6, Bowers teaches wherein the step of removing includes polishing (Col.5, lines: 5-25).

In reference to claim 7, Bowers teaches wherein the membrane comprises In, Ga, Al and N (Col.4, lines: 8-15).

In reference to claim 8, Bowers teaches wherein the substrate consists of Si (Col.6, lines: 40-45).

In reference to claim 9, Bowers teaches a method comprising:

providing a semiconductor membrane having a first crystal plane, the membrane having an insulating substrate attached on a first side of the semiconductor membrane and having a

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plurality of metal electrodes attached to a second side of the membrane (Abs. Lines: 1-5 and

Fig.2 (18) See also Col.6, lines: 50-55);

attaching a thermally conducting substrate having a second crystal plane to a first side of the semiconductor membrane such that the first and second planes are aligned (Col.4, lines: 5-25 and Fig.1);

removing the insulating substrate from the first side of the semiconductor membrane (Col.4, lines: 10-15);

placing a metal layer on the first side of the semiconductor membrane (Col.7, lines: 40-50);

In reference to claim 10, Bowers teaches further comprising:

cleaving the substrate along the second crystal plane and the first plane to make facets in the laser diode array (Abs, lines: 10-15).

In reference to claim 11, Bowers teaches wherein the substrate is Si (Col.6, lines: 40-45).

In reference to claim 12, Bowers teaches wherein the second crystal plane is the 111 plane.

In reference to claim 13, Bowers teaches a method comprising:

providing a semiconductor membrane having a first crystal plane, the membrane having an insulating substrate attached on a first side of the semiconductor membrane and having a

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plurality of metal electrodes attached to a second side of the membrane (Abs. Lines: 1-5 and Fig.2 (18) See also Col.6, lines: 50-55);

attaching a thermally conducting substrate having a second crystal plane to the first side of the semiconductor membrane such that the first and second planes are aligned (Col.5, lines: 1-5);

removing the insulating substrate from the first side of the semiconductor membrane (Col.4, lines: 10-15);

placing a metal layer on the first side of the semiconductor membrane (Col.7, lines: 40-50);

etching a trench through the metal layer and semiconductor membrane, dividing the metal and semiconductor into two sections (Col.12, lines: 50-55).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sore et al ('491) and Cheung et al ('795) teach similar methods.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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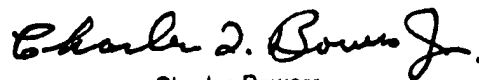
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M Schillinger whose telephone number is (703) 308-6425. The examiner can normally be reached on M-F 7:00 -4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers can be reached on (703) 308-2417. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1500.

LMS
September 19, 2001



Charles Bowers
Supervisory Patent Examiner
Technology Center 2800